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| 09/865,601      | 05/29/2001  | Yunzhi Gao           | GAO 1               | 4139             |

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EXAMINER

ALEJANDRO, RAYMOND

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1745

DATE MAILED: 05/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/865,601

Applicant(s)

GAO ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 2-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 18-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-19 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Election/Restrictions*

1. This application contains claims directed to the following patentably distinct species of the claimed invention, the following species have been identified:

Species 1: claims 2-9, directed to the bipolar separator comprising an aluminum layer;

Species 2: claims 10-17, directed to the bipolar separator comprising a heat-resistant polymer layer;

Species 3: claims 18-19, directed to the bipolar separator comprising a conductive film.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 1 is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to

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be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation (message) with Sheridan Neimark on 04/14/03 a provisional election was made with traverse to prosecute the invention of Species 3, claims 18-19. Affirmation of this election must be made by applicant in replying to this Office action. Claims 2-17 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Priority***

4. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on 05/26/00 and 06/06/00. It is noted, however, that applicant has not filed a certified copy of the 2000-157189 and 2000-169559 applications as required by 35 U.S.C. 119(b).

5. Clarifying note: Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon the application 2000-157189 filed in Japan on 05/26/00. A claim for priority under 35 U.S.C. 119(a)-(d) can be based on said application because even though the

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United States application was filed more than twelve months thereafter (Tuesday, May 29, 2001), Monday, May 28, 2001, was an official federal holiday (Memorial Day). Accordingly, May 29, 2001 was the next official government business day, and thus, the instant application was filed in a timely manner.

***Drawings***

6. The drawings filed on 05/29/01 has been accepted.

***Specification***

7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Language Suggestion***

8. In claim 19: it is suggested to delete the ":" within the claim language "made of: a metal". Appropriate correction is suggested.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1 and 18-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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11. Claim 1 recites the limitation "current collector" in line 1 and "collectors" in line 3.

There is insufficient antecedent basis for this limitation in the claim. Since the same limitation has been recited twice in the same claim, it would be unclear as to what particular collector the claim might intend to recite on subsequent claims, i.e. the collector separator or the collectors themselves (the ones that come into contact with the separator faces). Further clarification is required.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Quadakkers et al 5733682.

The instant application is directed to a bipolar separator wherein the disclosed inventive concept comprises the specific corrosion resistant layer disposed thereon. Other limitations include the specific the conductive film.

With respect to claim 1:

Quadakkers et al disclose a metallic bipolar plate for a fuel cell, the plate being a metal body (metal plate) having surfaces adapted to contact electrodes of the fuel cell and passages (flow channels) having walls confining gases; the body being composed of a metallic alloy wherein the alloy is being enriched with aluminum at least in regions of the walls in direct

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contact with the gases (ABSTRACT/claim 1). The bipolar plate consists of a metallic alloy with an aluminum enriched surface layer in the regions of the interconnector which are in contact with the gas (col 2, lines 35-38). *The regions which are in contact with the gas are the gas channels.*

It is disclosed that the aluminum enrichment which is applied at the surfaces of the gas-containing regions, especially internal surfaces of the gas passages, assures that in these places a protective coating is formed (col 2, line 67 to col 3, line 5) wherein the aluminum-enriched surface layer provides a bipolar plate with a significant corrosion resistance (col 2, lines 27-30). Quadackers et al further disclose that aluminum-based compositions provide the required corrosion resistance (col 1, lines 58-61). It is also disclosed that the bipolar plates serve as load carrying component (that is, as a current collector) (col 1, lines 37-41). Furthermore, the bipolar plate must have one of the following properties: good electrical conductivity (col 1, line 50).

Figure 1 illustrates the bipolar plate (1) arranged between an anode and a cathode wherein the bipolar plate has channels (4).

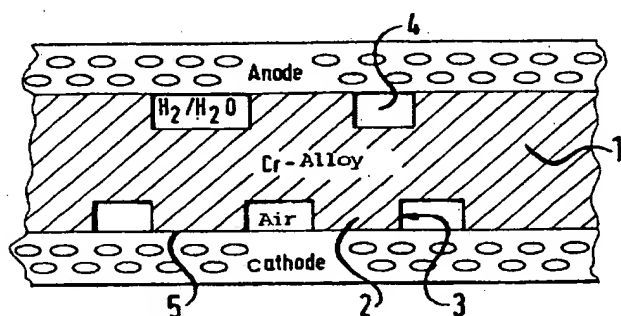
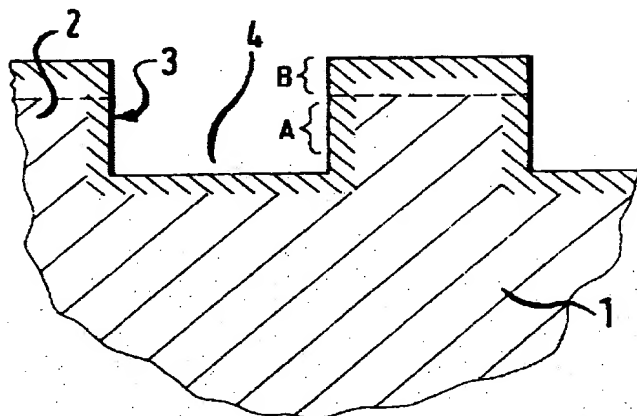


FIG. 1

Figure 2 shows the ribs (2) and the side walls (3) of the gas channel (4); wherein A and B represent the Al-enriched layers.

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**FIG. 2**

Thus, the claim is anticipated.

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



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16. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quadakkers et al 5733682 as applied to claim 1 above, and further in view of Faita et al 5482792.

Quadakkers et al is applied, argued and incorporated herein for the reasons above.

However, Quadakkers et al do not disclose the specific conductive film.

As to claims 18-19:

It is also disclosed that the bipolar plates may be optionally coated with an electroconductive protective film, for example made of platinum group metals or oxide thereof; alternatively the protective film may be made of conductive polymers of the type comprising intrinsically conductive materials or plastic materials containing conductive powders, for example graphite powder (col 10, lines 20-29).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific conductive film of Faita et al on contact faces of the bipolar plates of Quadakkers et al as Faita et al teach the bipolar plates may be optionally coated with an electroconductive protective film made of platinum group metals or plastic materials containing conductive powders such as graphite powder. It is desirable to dispose this specific conductive film on the bipolar plate surfaces because this conductive film on the bipolar plate contact face would enhance the ability of bipolar plates to resist possible aggressive conditions which may be particularly severe when the cell is fed with reactants on both electrode compartments.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro  
Examiner  
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A handwritten signature in black ink, appearing to be 'RAM', is located to the right of the typed name and title.